GA-H81TN
GA-B85TN
GA-H87TN
GA-Q87TN

User's Manual

12ME0-H81TN0-00R

Declaration of Conformity

We, Manufacturer/Importer,

G.B.T. Technology Trading GMbH

Address: Bullenkoppel 16, 22047 Hamburg, Germany

Declare that the product

Product Type: **Motherboard**

Product Name: **GA-H81TN**

conforms with the essential requirements of the following directives:

☒ **2004/108/EC EMC Directive:**

☒ Conduction & Radiated Emissions:	EN 55022:2010
☒ Immunity:	EN 55024:2010
☒ Power-line harmonics:	EN 61000-3-2:2006+A2:2009
☒ Power-line flicker:	EN 61000-3-3:2008

☒ **2006/95/EC LVD Directive**

☒ Safety:	EN60950-1:2006+A12:2011

☒ **2011/65/EU RoHS Directive**

☒ Restriction of use of certain substances in electronic equipment:	This product does not contain any of the restricted substances listed in Annex II, in concentrations and applications banned by the directive.

☒ **CE marking**

CE

Signature: Timmy Huang

(Stamp) Date: Sept. 23, 2013 Name: Timmy Huang

DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2.1077(a)

FC

Responsible Party Name: G.B.T. INC. (U.S.A.)

Address: 17358 Railroad Street
City of Industry, CA 91748

Phone/Fax No: (626) 854-9338/ (626) 854-9326

hereby declares that the product

Product Name: Motherboard

Model Number: GA-H81TN

Conforms to the following specifications:

FCC Part 15, Subpart B, Section 15.107(a) and Section 15.109 (a),Class B Digital Device

Supplementary Information:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful and (2) this device must accept any inference received, including that may cause undesired operation.

Representative Person's Name: ERIC LU

Signature: Eric Lu

Date: Sept. 23, 2013

Declaration of Conformity

We, Manufacturer/Importer,

G.B.T. Technology Trading GMbH

Address: Bullenkoppel 16, 22047 Hamburg, Germany

Declare that the product

Product Type: **Motherboard**

Product Name: **GA-B85TN**

conforms with the essential requirements of the following directives:

☒ **2004/108/EC EMC Directive:**

☒ Conduction & Radiated Emissions:	EN 55022:2010
☒ Immunity:	EN 55024:2010
☒ Power-line harmonics:	EN 61000-3-2:2006+A2:2009
☒ Power-line flicker:	EN 61000-3-3:2008

☒ **2006/95/EC LVD Directive**

☒ Safety:	EN60950-1:2006+A12:2011

☒ **2011/65/EU RoHS Directive**

☒ Restriction of use of certain substances in electronic equipment:	This product does not contain any of the restricted substances listed in Annex II, in concentrations and applications banned by the directive.

☒ **CE marking**

CE

Signature: Timmy Huang

(Stamp) Date: Sept. 23, 2013 Name: Timmy Huang

DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2.1077(a)

FC

Responsible Party Name: G.B.T. INC. (U.S.A.)

Address: 17358 Railroad Street
City of Industry, CA 91748

Phone/Fax No: (626) 854-9338/ (626) 854-9326

hereby declares that the product

Product Name: Motherboard

Model Number: GA-B85TN

Conforms to the following specifications:

FCC Part 15, Subpart B, Section 15.107(a) and Section 15.109 (a),Class B Digital Device

Supplementary Information:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful and (2) this device must accept any inference received, including that may cause undesired operation.

Representative Person's Name: ERIC LU

Signature: Eric Lu

Date: Sept. 23, 2013

Declaration of Conformity

We, Manufacturer/Importer,

G.B.T. Technology Trading GMbH

Address: Bullenkoppel 16, 22047 Hamburg, Germany

Declare that the product

Product Type: **Motherboard**

Product Name: **GA-H87TN**

conforms with the essential requirements of the following directives:

☒ **2004/108/EC EMC Directive:**

☒ Conduction & Radiated Emissions:	EN 55022:2010
☒ Immunity:	EN 55024:2010
☒ Power-line harmonics:	EN 61000-3-2:2006+A2:2009
☒ Power-line flicker:	EN 61000-3-3:2008

☒ **2006/95/EC LVD Directive**

☒ Safety:	EN60950-1:2006+A12:2011

☒ **2011/65/EU RoHS Directive**

☒ Restriction of use of certain substances in electronic equipment:	This product does not contain any of the restricted substances listed in Annex II, in concentrations and applications banned by the directive.

☒ **CE marking**

CE

Signature: Timmy Huang

(Stamp) Date: Sept. 23, 2013 Name: Timmy Huang

DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2.1077(a)

FC

Responsible Party Name: G.B.T. INC. (U.S.A.)

Address: 17358 Railroad Street
City of Industry, CA 91748

Phone/Fax No: (626) 854-9338/ (626) 854-9326

hereby declares that the product

Product Name: Motherboard

Model Number: GA-H87TN

Conforms to the following specifications:

FCC Part 15, Subpart B, Section 15.107(a) and Section 15.109 (a),Class B Digital Device

Supplementary Information:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful and (2) this device must accept any inference received, including that may cause undesired operation.

Representative Person's Name: ERIC LU

Signature: Eric Lu

Date: Sept. 23, 2013

Declaration of Conformity

We, Manufacturer/Importer,

G.B.T. Technology Trading GMbH

Address: Bullenkoppel 16, 22047 Hamburg, Germany

Declare that the product

Product Type: **Motherboard**

Product Name: **GA-Q87TN**

conforms with the essential requirements of the following directives:

☒ **2004/108/EC EMC Directive:**

☒ Conduction & Radiated Emissions:	EN 55022:2010
☒ Immunity:	EN 55024:2010
☒ Power-line harmonics:	EN 61000-3-2:2006+A2:2009
☒ Power-line flicker:	EN 61000-3-3:2008

☒ **2006/95/EC LVD Directive**

☒ Safety:	EN60950-1:2006+A12:2011

☒ **2011/65/EU RoHS Directive**

☒ Restriction of use of certain substances in electronic equipment:	This product does not contain any of the restricted substances listed in Annex II, in concentrations and applications banned by the directive.

☒ **CE marking**

CE

Signature: Timmy Huang

(Stamp) Date: Sept. 23, 2013 Name: Timmy Huang

DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2.1077(a)

FC

Responsible Party Name: G.B.T. INC. (U.S.A.)

Address: 17358 Railroad Street
City of Industry, CA 91748

Phone/Fax No: (626) 854-9338/ (626) 854-9326

hereby declares that the product

Product Name: Motherboard

Model Number: GA-Q87TN

Conforms to the following specifications:

FCC Part 15, Subpart B, Section 15.107(a) and Section 15.109 (a),Class B Digital Device

Supplementary Information:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful and (2) this device must accept any inference received, including that may cause undesired operation.

Representative Person's Name: ERIC LU

Signature: Eric Lu

Date: Sept. 23, 2013

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Documentation Classifications

In order to assist in the use of this product, GIGABYTE provides the following types of documentations:

- For detailed product information, carefully read the User's Manual.

For product-related information, check on our website at:
http://www.gigabyte.com

Table of Contents

Box Contents 6
GA-H81TN/GA-B85TN/GA-H87TN Motherboard Layout 7
GA-Q87TN Motherboard Layout 8

Chapter 1 Hardware Installation 9
1-1 Installation Precautions 9
1-2 Product Specifications 10
1-3 Installing the CPU and CPU Cooler 13
1-4 Installing the Memory/Expansion Card 13
1-5 Back Panel Connectors 14
1-6 Internal Connectors 16

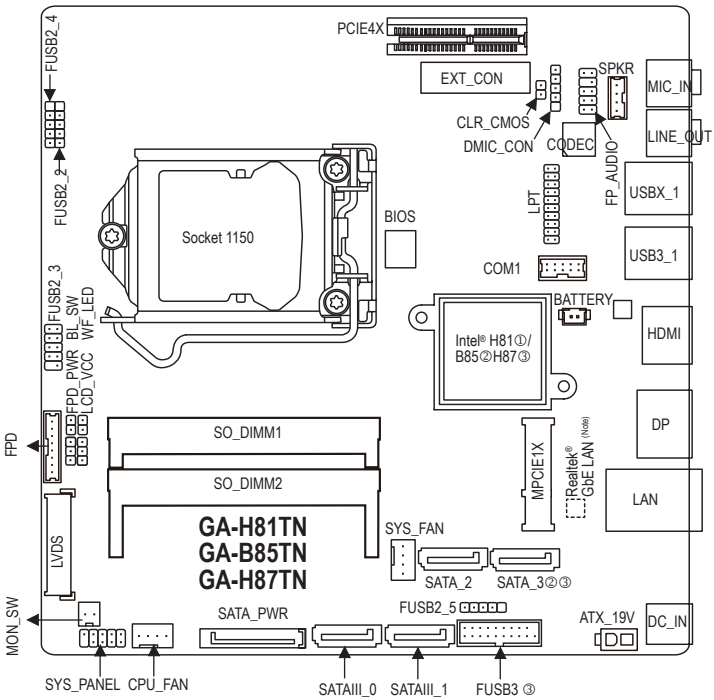
Chapter 2 BIOS Setup 29
2-1 The Main Menu 31
2-2 Advanced Menu 33
2-2-1 CPU Configuration 34
2-2-2 SATA Configuration 36
2-2-3 Trusted Computing 37
2-2-4 Intel (R) Rapid Start Technology 38
2-2-5 Intel(R) Smart Connect Technology 39
2-2-6 AMT Configuration 40
2-2-7 Super IO Configuration 41
2-2-8 H/W Monitor 42
2-3 Chipset Menu 43
2-4 Boot Menu 45
2-5 Security Menu 48
2-6 Save & Exit Menu 49

Box Contents

- ☑ GA-H81TN, GA-B85TN, GA-H87TN or GA-Q87TN motherboard
- ☑ Motherboard driver disk
- ☑ User's Manual
- ☑ I/O Shield (AIO Thin Mini-ITX x1, Standard Type x 1)
- ☑ Screws kit for expansion cards
- ☑ COM serial cable
- ☑ Cable SATA Power x 1

• The box contents above are for reference only and the actual items shall depend on the product package you obtain.

GA-H81TN/GA-B85TN/GA-H87TN Motherboard Layout



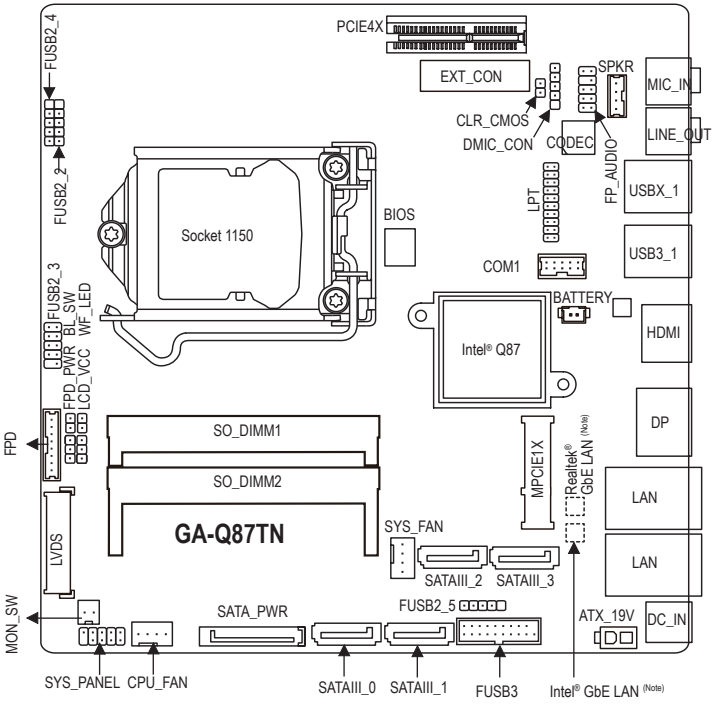
① Only for GA-H81TN.

② Only for GA-B85TN.

③ Only for GA-H87TN.

(Note) The chip is located on the back of the motherboard.

GA-Q87TN Motherboard Layout



(Note) The chip is located on the back of the motherboard.

Chapter 1 Hardware Installation

1-1 Installation Precautions

The motherboard contains numerous delicate electronic circuits and components which can become damaged as a result of electrostatic discharge (ESD). Prior to installation, carefully read the user's manual and follow these procedures:

- Prior to installation, make sure the chassis is suitable for the motherboard.
- Prior to installation, do not remove or break motherboard S/N (Serial Number) sticker or warranty sticker provided by your dealer. These stickers are required for warranty validation.
- Always remove the AC power by unplugging the power cord from the power outlet before installing or removing the motherboard or other hardware components.
- When connecting hardware components to the internal connectors on the motherboard, make sure they are connected tightly and securely.
- When handling the motherboard, avoid touching any metal leads or connectors.
- It is best to wear an electrostatic discharge (ESD) wrist strap when handling electronic components such as a motherboard, CPU or memory. If you do not have an ESD wrist strap, keep your hands dry and first touch a metal object to eliminate static electricity.
- Prior to installing the motherboard, please have it on top of an antistatic pad or within an electrostatic shielding container.
- Before unplugging the power supply cable from the motherboard, make sure the power supply has been turned off.
- Before turning on the power, make sure the power supply voltage has been set according to the local voltage standard.
- Before using the product, please verify that all cables and power connectors of your hardware components are connected.
- To prevent damage to the motherboard, do not allow screws to come in contact with the motherboard circuit or its components.
- Make sure there are no leftover screws or metal components placed on the motherboard or within the computer casing.
- Do not place the computer system on an uneven surface.
- Do not place the computer system in a high-temperature environment.
- Turning on the computer power during the installation process can lead to damage to system components as well as physical harm to the user.
- If you are uncertain about any installation steps or have a problem related to the use of the product, please consult a certified computer technician.

1-2 Product Specifications

CPU	◆	Support for Intel® Core™ i7 processors/Intel® Core™ i5 processors/ Intel® Core™ i3 processors/Intel® Pentium® processors/Intel® Celeron® processors in the LGA1150 package (Supports up to 84W) (Go to GIGABYTE's website for the latest CPU support list.)
	◆	L3 cache varies with CPU
Chipset	◆	Intel® H81①/B85②/H87③/Q87④ Express Chipset
Memory	◆	2 x 1.5V DDR3 SO-DIMM sockets supporting up to 8 GB of system memory * Due to a Windows 32-bit operating system limitation, when more than 4 GB of physical memory is installed, the actual memory size displayed will be less than the size of the physical memory installed.
	◆	Dual channel memory architecture
	◆	Support for DDR3 1600/1333 MHz memory modules (Go to GIGABYTE's website for the latest supported memory speeds and memory modules.)
Onboard Graphics	◆	Chipset: - 1 x HDMI 1.4 port, supporting a maximum resolution of 4096x2160 - 1 x DisplayPort, supporting a maximum resolution of 2560x1600 - 1 x LVDS connector
Audio	◆	Realtek® ALC887 codec
	◆	High Definition Audio
	◆	2/4/5.1/7.1-channel * To configure 5.1/7.1-channel audio, you have to use an HD front panel audio module and enable the multi-channel audio feature through the audio driver.
LAN	◆	1 x Realtek® GbE LAN chip (10/100/1000 Mbit) (LAN1) ①②③④
	◆	1 x Intel® GbE LAN chip (10/100/1000 Mbit) (LAN2) ④
Expansion Slots	◆	1 x PCI Express x4 slot (Supports 25W only) (The PCIEX4 slot conforms to PCI Express 3.0 standard.)
	◆	1 x Mini PCI Express x1 slot
Storage Interface	◆	Chipset: - 2 x SATA 6Gb/s connectors (SATAIII 0/1); 1 x SATA 3Gb/s connector (SATAII 2) ① - 3 x SATA 6Gb/s connectors (SATAIII 0/1/3); 1 x SATA 3Gb/s connector (SATAII 2) ② - 4 x SATA 6Gb/s connectors (SATAIII 0/1/2/3) ③④ - 1 x mSATA connector

① Only for GA-H81TN.
② Only for GA-B85TN.
③ Only for GA-H87TN.
④ Only for GA-Q87TN.

USB	◆	Chipset: - 2 x USB 3.0/2.0 ports; 7 x USB 2.0/1.1 ports ① - 4 x USB 3.0/2.0 ports; 5 x USB 2.0/1.1 ports ② - 6 x USB 3.0/2.0 ports; 5 x USB 2.0/1.1 ports ③④ * USB 2.0/1.1 ports available through the internal USB headers (Card reader/Touch panel/webcam and other devices)
Internal Connectors	◆	1 x 2-pin power connector
	◆	1 x CPU fan header
	◆	1 x system fan header
	◆	2 x SATA 6Gb/s connectors ①
	◆	3 x SATA 6Gb/s connectors ②
	◆	4 x SATA 6Gb/s connectors ③④
	◆	1 x SATA 3Gb/s connector ①②
	◆	1 x mSATA connector
	◆	1 x SATA power connector
	◆	4 x USB 2.0/1.1 headers
	◆	1 x serial port header
	◆	1 x parallel port header
	◆	1 x front panel header
	◆	1 x front panel audio header
	◆	1 x digital microphone header
	◆	1 x AIO speaker header
	◆	1 x LVDS connector
	◆	1 x LVDS drive voltage header
	◆	1 x flat panel display power header (both panel and backlight inverter)
	◆	1 x flat panel display power connector
	◆	1 x backlight switch header
	◆	1 x flat panel display switch header
	◆	1 x WIFI activity indicator LED header
	◆	1 x Clear CMOS jumper
Back Panel Connectors	◆	1 x HDMI port
	◆	1 x DisplayPort
	◆	4 x USB 3.0/2.0 ports ②③④
	◆	2 x USB 3.0/2.0 ports ①
	◆	2 x USB 2.0/1.1 ports ①
	◆	1 x RJ-45 port ①②③
	◆	2 x RJ-45 ports ④
	◆	2 x audio jacks (Line Out, Mic In)
	◆	1 x DC-In power connector

① Only for GA-H81TN.
② Only for GA-B85TN.
③ Only for GA-H87TN.
④ Only for GA-Q87TN.

I/O Controller	◆	Nuvoton I/O Controller Chip
Hardware Monitor	◆	System voltage detection ◆ CPU/System temperature detection ◆ CPU/System fan speed detection ◆ CPU fan speed control * For 4-pin CPU coolers only. * Whether the CPU fan speed control function is supported will depend on the CPU cooler you install.
BIOS	◆	1 x 64 Mbit flash ① ◆ 1 x 128 Mbit flash ②③④ ◆ Use of licensed AMI EFI BIOS ◆ PnP 1.0a, DMI 2.0, SM BIOS 2.6, ACPI 2.0a
Operating System	◆	Support for Windows 8/7
Form Factor	◆	Thin Mini-ITX Form Factor; 17.0cm x 17.0cm

* GIGABYTE reserves the right to make any changes to the product specifications and product-related information without prior notice.

- GIGABYTE recommends 180W power adapters for processors above 84W TDP. Processors with a TDP lower than 84W, may use 150W power adapters.
- Power adapter connector dimension: 7.4 x 5.1mm, 180W = 19V / 9.47A, 150W = 19V / 7.89A.

① Only for GA-H81TN.
② Only for GA-B85TN.
③ Only for GA-H87TN.
④ Only for GA-Q87TN.

1-3 Installing the CPU and CPU Cooler

Read the following guidelines before you begin to install the CPU/CPU cooler:

- Make sure that the motherboard supports the CPU.
  (Go to GIGABYTE's website for the latest CPU support list.)
- Always turn off the computer and unplug the power cord from the power outlet before installing the CPU to prevent hardware damage.
- Locate the pin one of the CPU. The CPU cannot be inserted if oriented incorrectly. (Or you may locate the notches on both sides of the CPU and alignment keys on the CPU socket.)
- Apply an even and thin layer of thermal grease on the surface of the CPU.
- Do not turn on the computer if the CPU cooler is not installed, otherwise overheating and damage of the CPU may occur.
- Set the CPU host frequency in accordance with the CPU specifications. It is not recommended that the system bus frequency be set beyond hardware specifications since it does not meet the standard requirements for the peripherals. If you wish to set the frequency beyond the standard specifications, please do so according to your hardware specifications including the CPU, graphics card, memory, hard drive, etc.
- For installing the CPU cooler, please refer to chassis user's manual.

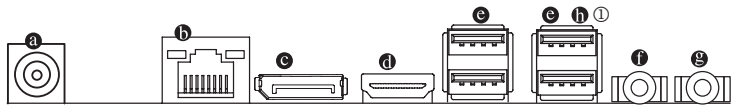
1-4 Installing the Memory/Expansion Card

Read the following guidelines before you begin to install the memory expansion card:

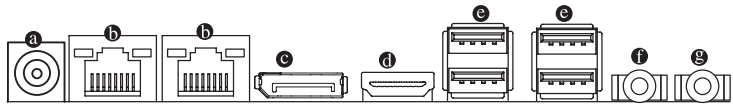
- Make sure that the motherboard supports the memory. It is recommended that memory of the same capacity, brand, speed, and chips be used. (Go to GIGABYTE's website for the latest supported memory speeds and memory modules.)
- Make sure the motherboard supports the expansion card. Carefully read the manual that came with your expansion card.
- Always turn off the computer and unplug the power cord from the power outlet before installing the memory/expansion card to prevent hardware damage.
- Memory modules have a foolproof design. A memory module can be installed in only one direction. If you are unable to insert the memory, switch the direction.

1-5 Back Panel Connectors

GA-H81TN/GA-B85TN/GA-H87TN:



GA-Q87TN:

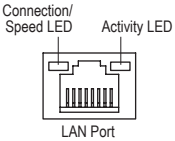


a DC Power Connector

Connect the DC power to this port.

b RJ-45 LAN Port

The Gigabit Ethernet LAN port provides Internet connection at up to 1 Gbps data rate. The following describes the states of the LAN port LEDs.



Connection/Speed LED:

State	Description
Orange	1 Gbps data rate
Green	100 Mbps data rate
Off	10 Mbps data rate

Activity LED:

State	Description
Blinking	Data transmission or receiving is occurring
Off	No data transmission or receiving is occurring

c DisplayPort

DisplayPort is a digital display interface which is primarily used to connect a video source to a display device such as a computer monitor, though it can also be used to transmit audio, USB, and other forms of data.

d HDMI Port

HDMI™ The HDMI (High-Definition Multimedia Interface) provides an all-digital audio/video interface to transmit the uncompressed audio/video signals and is HDCP compliant. Connect the HDMI audio/video device to this port. The HDMI Technology can support a maximum resolution of 4096x2160 but the actual resolutions supported depend on the monitor being used.

- When After installing the HDMI device, make sure the default device for sound playback is the HDMI device. (The item name may differ by operating system. Refer the figures below for details.), and enter BIOS Setup, then set Onboard VGA output connect to D-SUB/HDMI under Advanced BIOS Features.
- Please note the HDMI audio output only supports AC3, DTS and 2-channel-LPCM formats. (AC3 and DTS require the use of an external decoder for decoding.)

① Only for GA-H81TN.

USB 3.0/2.0/1.1 Port

The USB port supports the USB 3.0 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive and etc.

Line Out Jack (Green)

The default Line Out (Front Speaker Out) jack. Stereo speakers, earphone or front surroundspeakers can be connected to Line Out (Front Speaker Out) jack.

Mic In Jack (Pink)

The default MIC In jack. Microphone cab be connected to MIC In jack.

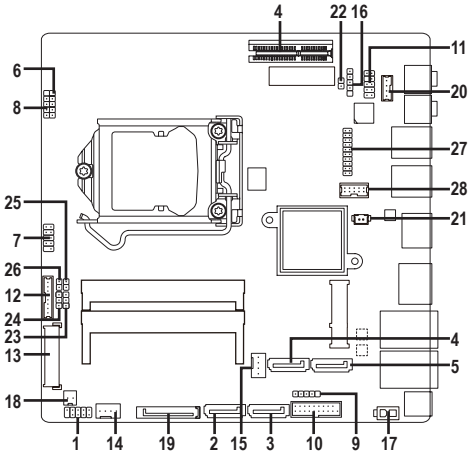
USB 2.0/1.1 Port ①

The USB port supports the USB 2.0 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive and etc.

- When removing the cable connected to a back panel connector, first remove the cable from your device and then remove it from the motherboard.
- When removing the cable, pull it straight out from the connector. Do not rock it side to side to prevent an electrical short inside the cable connector.

① Only for GA-H81TN.

1-6 Internal Connectors



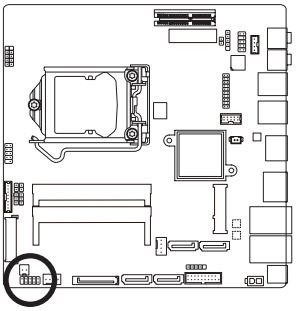
1)	SYS_PANEL	15)	SYS_FAN
2)	SATAIII_0	16)	DMIC_CON
3)	SATAIII_1	17)	ATX_19V
4)	SATAIII_2	18)	MON_SW
5)	SATAIII_3	19)	SATA_PWR
6)	FUSB2_2	20)	SPKR
7)	FUSB2_3	21)	BATTERY
8)	FUSB2_4	22)	CLR_CMOS
9)	FUSB2_5	23)	LCD_VCC
10)	FUSB3	24)	FPD_PWR
11)	FP_AUDIO	25)	WF_LED
12)	FPD	26)	BL_SW
13)	LVDS	27)	LPT
14)	CPU_FAN	28)	COM1

Read the following guidelines before connecting external devices:

- First make sure your devices are compliant with the connectors you wish to connect.
- Before installing the devices, be sure to turn off the devices and your computer. Unplug the power cord from the power outlet to prevent damage to the devices.
- After installing the device and before turning on the computer, make sure the device cable has been securely attached to the connector on the motherboard.

1) SYS_PANEL (Front Panel Header)

Connect the power switch, reset switch, speaker, chassis intrusion switch/sensor and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.

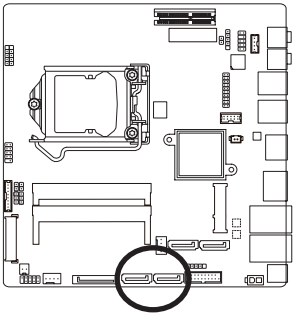


Pin No.	Signal Name	Definition
1	HD+	Hard Disk LED Signal anode (+)
2	MPD+	Power LED Signal anode (+)
3	HD-	Hard Disk LED Signal cathode(-)
4	MPD-	Power LED Signal cathode(-)
5	GND	Ground
6	PW+	Power Button anode (+)
7	RST	Reset Button
8	PW-	Power Button cathode(-)
9	WF_LED	Wifi active LED Signal

The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

2/3) SATAIII_0/1 (SATA 6Gb/s Connector)

The SATA connectors conform to SATA 6Gb/s standard and are compatible with SATA 3Gb/s and SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device.



Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

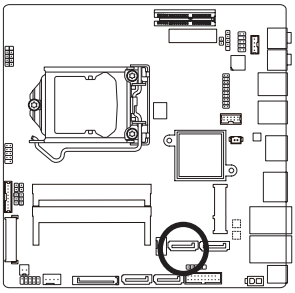
① Only for GA-H81TN.
② Only for GA-B85TN.
③ Only for GA-H87TN.
④ Only for GA-Q87TN.

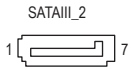
4) SATAIII_2 (SATA 6Gb/s Connector) ④③

The SATA connectors conform to SATA 6Gb/s standard and are compatible with SATA 3Gb/s and SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device.

SATAIII_2 (SATA 3Gb/s Connector) ①②

The SATA connectors conform to SATA 3Gb/s standard and are compatible with SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device.

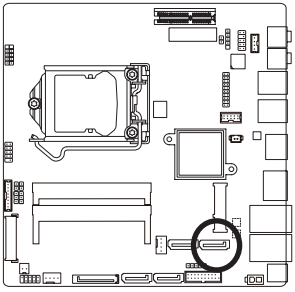




Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

5) SATAIII_3 (SATA 6Gb/s Connector) ②③④

The SATA connectors conform to SATA 6Gb/s standard and are compatible with SATA 3Gb/s and SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device.

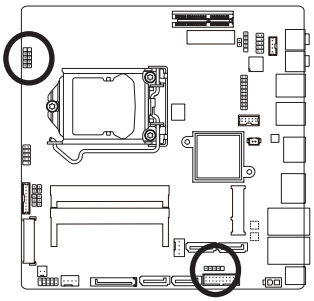


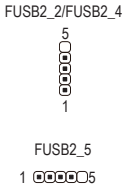
Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

① Only for GA-H81TN.
② Only for GA-B85TN.
③ Only for GA-H87TN.
④ Only for GA-Q87TN.

6/8/9) FUSB2_1/2/4/5 (USB Header)

The headers conform to USB 2.0/1.1 specification. Each header supports a single device.

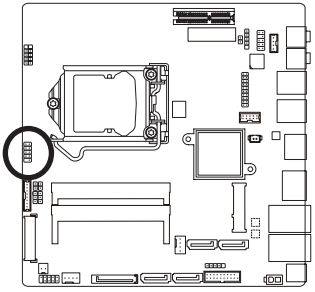




Pin No.	Definition
1	VCC
2	USB-
3	USB+
4	GND
5	No Pin

7) FUSB2_3 (USB Headers)

The headers conform to USB 2.0/1.1 specification. Each USB header can provide two USB ports via an optional USB bracket. For purchasing the optional USB bracket, please contact the local dealer.

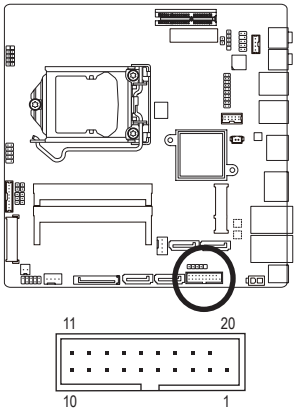


Pin No.	Definition
1	VCC
2	VCC
3	USB-
4	USB-
5	USB+
6	USB+
7	GND
8	GND
9	No Pin
10	NC

① Only for GA-H81TN.
② Only for GA-B85TN.
③ Only for GA-H87TN.
④ Only for GA-Q87TN.

10) FUSB3 (USB 3.0/2.0 Header)

The header conforms to USB 3.0/2.0 specification and can provide two USB ports. For purchasing the optional 3.5" front panel that provides two USB 3.0/2.0 ports, please contact the local dealer.

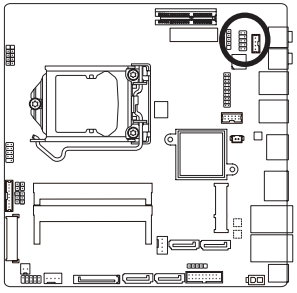


Pin No.	Definition	Pin No.	Definition
1	VBUS	11	D2+
2	SSRX1-	12	D2-
3	SSRX1+	13	GND
4	GND	14	SSTX2+
5	SSTX1-	15	SSTX2-
6	SSTX1+	16	GND
7	GND	17	SSRX2+
8	D1-	18	SSRX2-
9	D1+	19	VBUS
10	NC	20	No Pin

Prior to installing the USB bracket, be sure to turn off your computer and unplug the power cord from the power outlet to prevent damage to the USB bracket.

11) FP_AUDIO (Front Panel Audio Header)

The front panel audio header supports Intel® High Definition audio (HD) and AC'97 audio. You may connect your chassis front panel audio module to this header. Make sure the wire assignments of the module connector match the pin assignments of the motherboard header. Incorrect connection between the module connector and the motherboard header will make the device unable to work or even damage it.



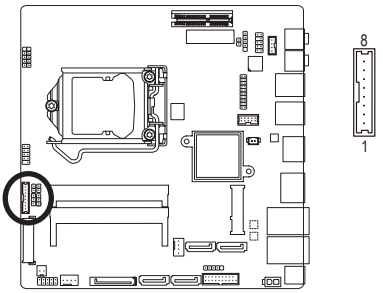
Pin No.	Definition
1	F_MIC_L
2	GND
3	F_MIC_R
4	GPIO_DET
5	F_LINE_R
6	F_MIC_JD
7	GND
8	No Pin
9	F_LINE_L
10	F_LINE_JD

- The front panel audio header supports HD audio by default.
- Audio signals will be present on both of the front and back panel audio connections simultaneously.
- Some chassis provide a front panel audio module that has separated connectors on each wire instead of a single plug. For information about connecting the front panel audio module that has different wire assignments, please contact the chassis manufacturer.

12) FPD (Flat Panel Display Headers)

The FPD is a high-speed interface connecting the output of a video controller in a laptop computer, computer monitor or LCD television set to the display panel. Most laptops, LCD computer monitors and LCD TVs use this interface internally.

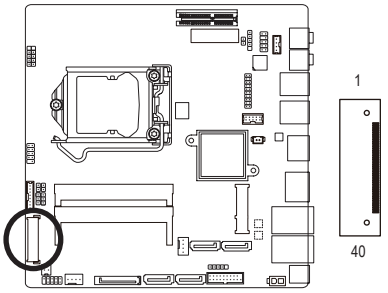
The headers conform to FPD specification.



Pin No.	Definition
1	BKLT_EN
2	BKLT_PWM
3	BKLT_PWR
4	BKLT_PWR
5	BKLT_GND/Brightness_GND
6	BKLT_GND/Brightness_GND
7	Brightness_Up
8	Brightness_Down

13) LVDS (LVDS Header)

LVDS stands for Low-voltage differential signaling, which uses high-speed analog circuit techniques to provide multigigabit data transfers on copper interconnects and is a generic interface standard for high-speed data transmission.

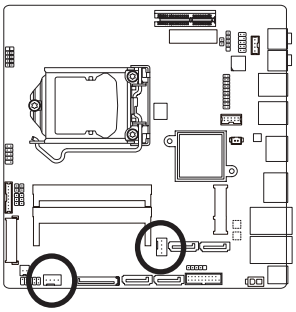


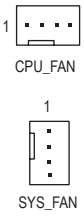
Pin No.	Definition	Pin No.	Definition
1	ODD_Lane3_P	21	NC
2	ODD_Lane3_N	22	EDID_3.3V
3	ODD_Lane2_P	23	LCD_GND
4	ODD_Lane2_N	24	LVDS SENSE (Note)
5	ODD_Lane1_P	25	LCD_GND
6	ODD_Lane1_N	26	ODD_CLK_P
7	ODD_Lane0_P	27	ODD_CLK_N
8	ODD_Lane0_N	28	BLKT_GND
9	EVEN_Lane3_P	29	BLKT_GND
10	EVEN_Lane3_N	30	BLKT_GND
11	EVEN_Lane2_P	31	EDID_CLK
12	EVEN_Lane2_N	32	BLKT_ENABLE
13	EVEN_Lane1_P	33	BLKT_PWM_DIM
14	EVEN_Lane1_N	34	EVEN_CLK_P
15	EVEN_Lane0_P	35	EVEN_CLK_N
16	EVEN_Lane0_N	36	BLKT_PWR
17	EDID_GND	37	BLKT_PWR
18	LCD_VCC	38	BLKT_PWR
19	LCD_VCC	39	NC
20	LCD_VCC	40	EDID_DATA

(Note) LVDS SENSE must link cable LCD Panel GND.

14/15) CPU_FAN/SYS_FAN (Fan Headers)

All fan headers on this motherboard are 4-pin. Most fan headers possess a foolproof insertion design. When connecting a fan cable, be sure to connect it in the correct orientation (the black connector wire is the ground wire). The speed control function requires the use of a fan with fan speed control design. For optimum heat dissipation, it is recommended that a system fan be installed inside the chassis.



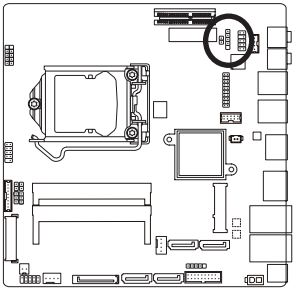


Pin No.	Definition
1	GND
2	+12V
3	Sense
4	Speed Control

- Be sure to connect fan cables to the fan headers to prevent your CPU and system from overheating. Overheating may result in damage to the CPU or the system may hang.
- These fan headers are not configuration jumper blocks. Do not place a jumper cap on the headers.

16) DMIC_CON (DMIC Headers)

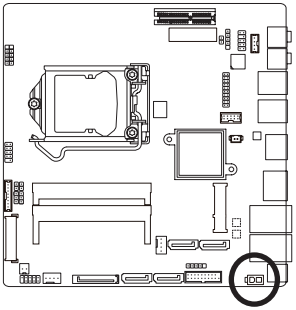
This header is for a digital microphone.



Pin No.	Definition
1	Power
2	DMI DATA
3	GND
4	DMI CLK
5	No Pin

17) ATX_19V (2 Pin Power Connector)

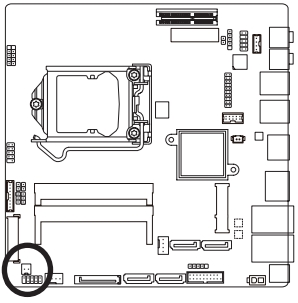
This power connector is for the integrated 19V chassis power supply.



Pin No.	Definition
1	GND
2	+19V

18) MON_SW (Flat panel display switch header)

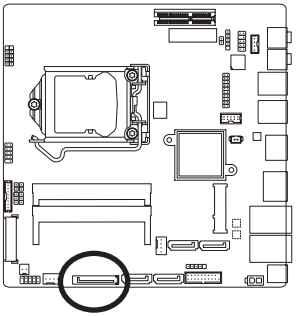
This header allows you to connect an on/off switch for the display.

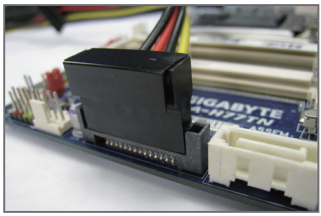


Pin No.	Definition
1	Mon_SW
2	GND

19) SATA_PWR (SATA Power Connector)

This connector provides power to installed SATA devices.

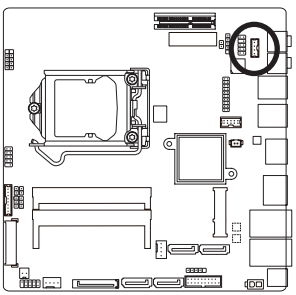




Connect the included SATA power cable to the SATA_PWR connector. Then connect the SATA/optical drive power connectors to your hard drive and optical drive.

20) SPKR (Speaker Header)

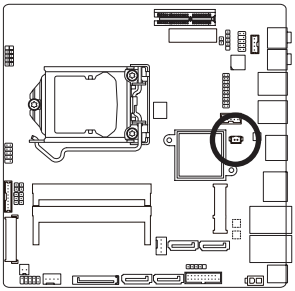
This header connects to the speaker on the chassis front panel. The system reports system startup status by issuing a beep code. One single short beep will be heard if no problem is detected at system startup.



Pin No.	Definition
1	Speaker OUT L-
2	Speaker OUT L+
3	Speaker OUT R+
4	Speaker OUT R-

21) BATTERY (Battery Cable Connector)

The battery provides power to keep the values (such as BIOS configurations, date, and time information) in the CMOS when the computer is turned off. Replace the battery when the battery voltage drops to a low level, or the CMOS values may not be accurate or may be lost.

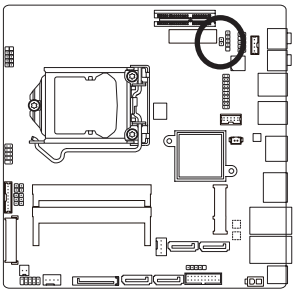


Pin No.	Definition
1	RTC Reset
2	GND

- Always turn off your computer and unplug the power cord before replacing the battery.
- Replace the battery with an equivalent one. Danger of explosion if the battery is replaced with an incorrect model.
- Contact the place of purchase or local dealer if you are not able to replace the battery by yourself or uncertain about the battery model.
- Used batteries must be handled in accordance with local environmental regulations.

22) CLR_CMOS (Clearing CMOS Jumper)

Use this jumper to clear the CMOS values (e.g. date information and BIOS configurations) and reset the CMOS values to factory defaults. To clear the CMOS values, use a metal object like a screwdriver to touch the two pins for a few seconds.



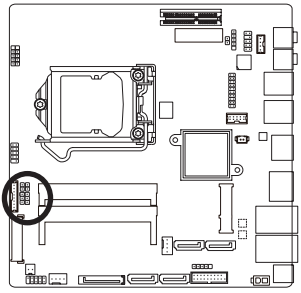
Open: Normal operation (Default setting)

Close: Clear CMOS data

- Always turn off your computer and unplug the power cord from the power outlet before clearing the CMOS values.
- After system restart, go to BIOS Setup to load factory defaults (select Load Optimized Defaults) or manually configure the BIOS settings (refer to Chapter 2, "BIOS Setup," for BIOS configurations).

23) LCD_VCC (LVDS Drive Boltage Jumper)

This jumper can be used to provide different screen voltage settings.

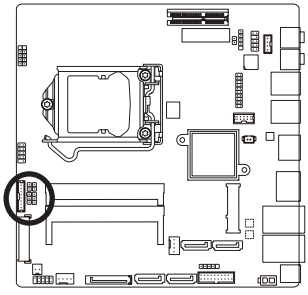


1-2 Close: Set to 3V.

2-3 Close: Set to 5V. (Default setting)

24) FPD_PWR (Flat Panel Display Power Jumper)

This jumper allows you to select the required operating voltage for the backlight panel.

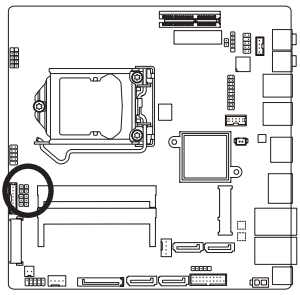


1-2 Close: Set to 12V.

2-3 Close: Set to 19V. (Default setting)

25) WF_LED (WIFI Activity Indicator LED Header)

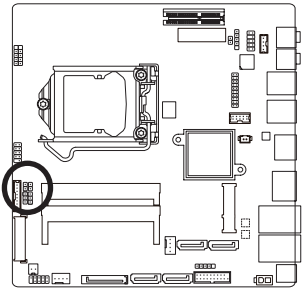
This header allows you to connect a WiFi operation indicator LED.



Pin No.	Definition
1	GND
2	LED_WLAN

26) BL_SW (Back Light Switch)

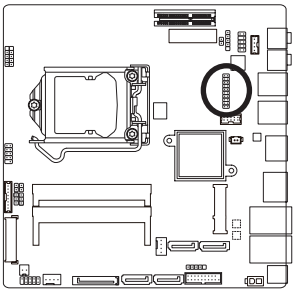
The Back Light switch provides the function for screen back light adjustment.



Pin No.	Definition
1	BL_DOWN
2	BL_UP

27) LPT (Parallel Port Header)

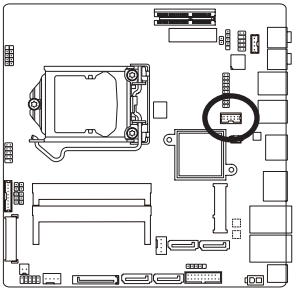
The LPT header can provide one parallel port via an optional LPT port cable. For purchasing the optional LPT port cable, please contact the local dealer.



Pin No.	Definition	Pin No.	Definition
1	STB-	11	PD4
2	BUSY	12	INIT-
3	PD0	13	PD5
4	PE	14	SLIN-
5	PD1	15	PD6
6	SLCT	16	GND
7	PD2	17	PD7
8	AFD-	18	GND
9	PD3	19	ACK-
10	ERR-	20	GND

28) COM1 (Serial Port Header)

The COM header can provide one serial port via an optional COM port cable. For purchasing the optional COM port cable, please contact the local dealer.



Pin No.	Definition
1	NDCD-
2	NDSR-
3	NSIN
4	NRTS-
5	NSOUT
6	NCTS-
7	NDTR-
8	NRI-
9	GND
10	No Pin

Chapter 2 BIOS Setup

BIOS (Basic Input and Output System) records hardware parameters of the system in the CMOS on the motherboard. Its major functions include conducting the Power-On Self-Test (POST) during system startup, saving system parameters and loading operating system, etc. BIOS includes a BIOS Setup program that allows the user to modify basic system configuration settings or to activate certain system features. When the power is turned off, the battery on the motherboard supplies the necessary power to the CMOS to keep the configuration values in the CMOS.

To access the BIOS Setup program, press the <F2> key during the POST when the power is turned on.

- BIOS flashing is potentially risky, if you do not encounter problems of using the current BIOS version, it is recommended that you don't flash the BIOS. To flash the BIOS, do it with caution. Inadequate BIOS flashing may result in system malfunction.
- It is recommended that you not alter the default settings (unless you need to) to prevent system instability or other unexpected results. Inadequately altering the settings may result in system's failure to boot. If this occurs, try to clear the CMOS values and reset the board to default values. (Refer to the "Restore Defaults" section in this chapter or introductions of the battery/clearing CMOS jumper in Chapter 1 for how to clear the CMOS values.)

BIOS Setup Program Function Keys

<↑><↓>	Move the selection bar to select an item
<←><→>	Move the selection bar to select the screen
<Enter>	Execute command or enter the submenu
<Esc>	Main Menu: Exit the BIOS Setup program Submenus: Exit current submenu
<+>	Increase the numeric value or make changes
<->	Decrease the numeric value or make changes
<F1>	General Help
<F2>	Restore the previous BIOS settings for the current submenus
<F3>	Load the Optimized BIOS default settings for the current submenus
<F4>	Save all the changes and exit the BIOS Setup program

- **Main**

  This setup page includes all the items in standard compatible BIOS
- **Advanced**

  This setup page includes all the items of AMI BIOS special enhanced features.
  (ex: Auto detect fan and temperature status, automatically configure hard disk parameters.)
- **Chipset**

  Northbridge and Southbridge additional features configuration.
- **Boot**

  This setup page provides items for configuration of boot sequence.
- **Security**

  Change, set, or disable supervisor and user password. Configuration supervisor password allows you to restrict access to the system and BIOS Setup.
  A supervisor password allows you to make changes in BIOS Setup.
  A user password only allows you to view the BIOS settings but not to make changes.
- **Save & Exit**

  Save all the changes made in the BIOS Setup program to the CMOS and exit BIOS Setup. (Pressing <F10> can also carry out this task.)
  Abandon all changes and the previous settings remain in effect. Pressing <Y> to the confirmation message will exit BIOS Setup. (Pressing <Esc> can also carry out this task.)

2-1 The Main Menu

Once you enter the BIOS Setup program, the Main Menu (as shown below) appears on the screen. Use arrow keys to move among the items and press <Enter> to accept or enter other sub-menu.

Main Menu Help

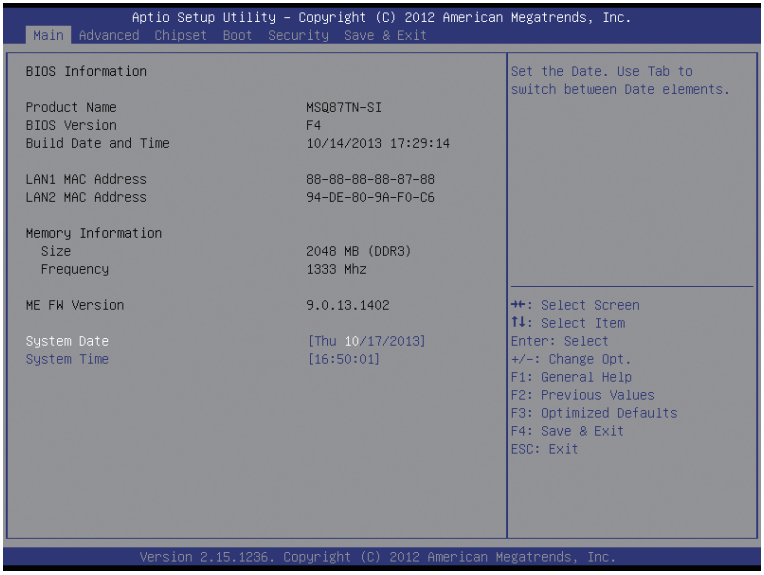
The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu.

Submenu Help

While in a submenu, press <F1> to display a help screen (General Help) of function keys available for the menu. Press <Esc> to exit the help screen. Help for each item is in the Item Help block on the right side of the submenu.

(Sample BIOS Version: MSQ87TN-SI F4a)

- When the system is not stable as usual, select the **Restore Defaults** item to set your system to its defaults.
- The BIOS Setup menus described in this chapter are for reference only and may differ by BIOS version.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
BIOS Information
Product Name MSQ87TN-SI
BIOS Version F4
Build Date and Time 10/14/2013 17:29:14
LAN1 MAC Address 88-88-88-88-87-88
LAN2 MAC Address 94-DE-80-9A-F0-C6
Memory Information
Size 2048 MB (DDR3)
Frequency 1333 Mhz
ME FW Version 9.0.13.1402
System Date [Thu 10/17/2013]
System Time [16:50:01]
Set the Date. Use Tab to switch between Date elements.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
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☞ **BIOS Information**

☞ **Product Name**

Display the information motherboard model.

☞ **BIOS Version**

Display the BIOS version.

☞ **Build Date and Time**

Displays the date and time when the BIOS setup utility was created.

☞ **LAN1/2 MAC Address**

Displays the MAC address information.

☞ **Memory Information**

☞ **Size**

Determines how much total memory is present during the POST.

☞ **Frequency**

Display the memory frequency information.

☞ **ME FW Version**

Display the ME firmware version.

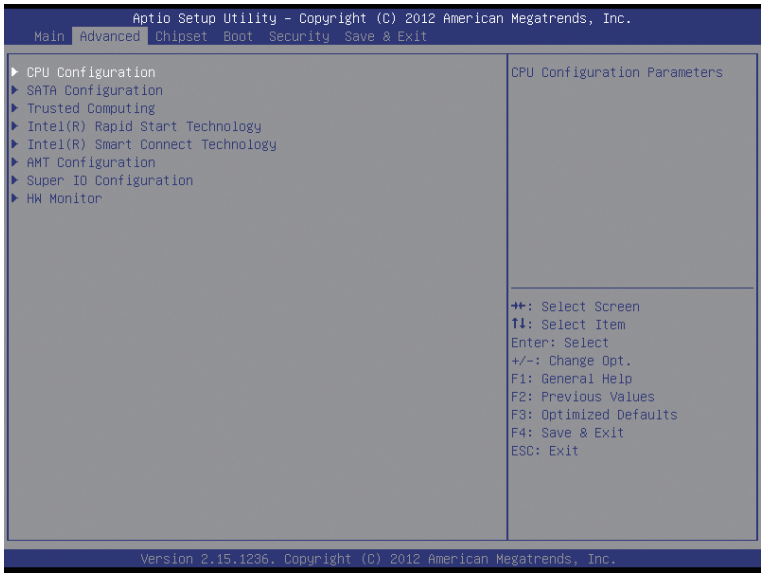
☞ **System Date**

Set the date following the weekday-month-day- year format.

☞ **System Time**

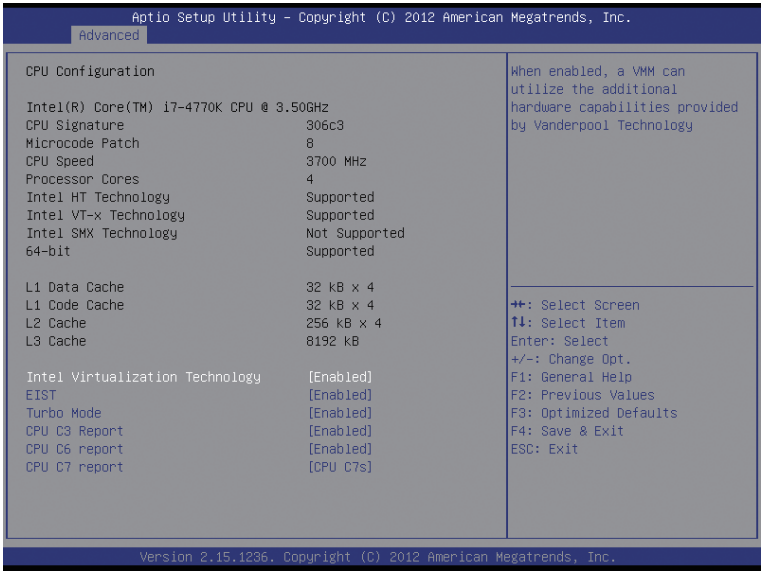
Set the system time following the hour-minute- second format.

2-2 Advanced Menu



The Advanced menu display submenu options for configuring the function of various hardware components. Select a submenu item, then press Enter to access the related submenu screen.

2-2-1 CPU Configuration


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
CPU Configuration
Intel(R) Core(TM) i7-4770K CPU @ 3.50GHz
CPU Signature 306c3
Microcode Patch 8
CPU Speed 3700 MHz
Processor Cores 4
Intel HT Technology Supported
Intel VT-x Technology Supported
Intel SMX Technology Not Supported
64-bit Supported
L1 Data Cache 32 kB x 4
L1 Code Cache 32 kB x 4
L2 Cache 256 kB x 4
L3 Cache 8192 kB
Intel Virtualization Technology [Enabled]
EIST [Enabled]
Turbo Mode [Enabled]
CPU C3 Report [Enabled]
CPU C6 report [Enabled]
CPU C7 report [CPU C7s]
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

☞ **CPU Type**

Displays the processor type information.

☞ **CPU Signature**

Displays the processor ID information.

☞ **Microcode Patch**

Display the information of the processor microcode patch.

☞ **CPU Speed**

Display the information of the processor speed.

☞ **Processor Cores**

Display the information of the processor core.

☞ **Intel HT Technology**

Display Intel Hyper Threading Technology function support information.

☞ **Intel VT-x Technology**

Display Intel Virtualization Technology function support information.

☞ **Intel SMX Technology**

Display Intel Safer Mode Extensions Technology function support information.

☞ **64-bit**

Display the supported infprmation of installed CPU.

☞ **L1 Data Cache**

Display the information of L1 Data Cache.

☞ **L1 Code Cache**

Display the information of L1 Code Cache.

☞ **L2 Cache**

Display the information of L2 Cache per Core.

☞ **L3 Cache**

Display the information of total L3 Cache per socket.

☞ **Intel TXT(LT) Support** (Note)

Enables or disables **Intel® Trusted Execution Technology** (Intel® TXT). Intel® Trusted Execution Technologyprovides a hardware-based security foundation. Default setting is **Enabled**.

☞ **Intel Virtualization Technology** (Note)

Select whether to enable the Intel Virtualization Technology function. VT allows a single platform to run multiple operating systems in independent partitions.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **EIST (Enhanced Intel SpeedStep Technology)**

Conventional Intel SpeedStep Technology switches both voltage and frequency in tandem between high and low levels in response to processor load.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Turbo Mode**

When this feature is enabled, the processor can dynamically overclock one or two of its four processing cores to improve performance with applications that are not multi-threaded or optimized for quad-core processors.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **CPU C3/C6 Report** (Note)

Allows you to determine whether to let the CPU enter C3/C6 mode in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. The C3/C6 state is a more enhanced power-saving state than C1.

Options available: Enabled/Disabled. Default setting is **Enabled**.

Default setting for C3 is **Enabled**.

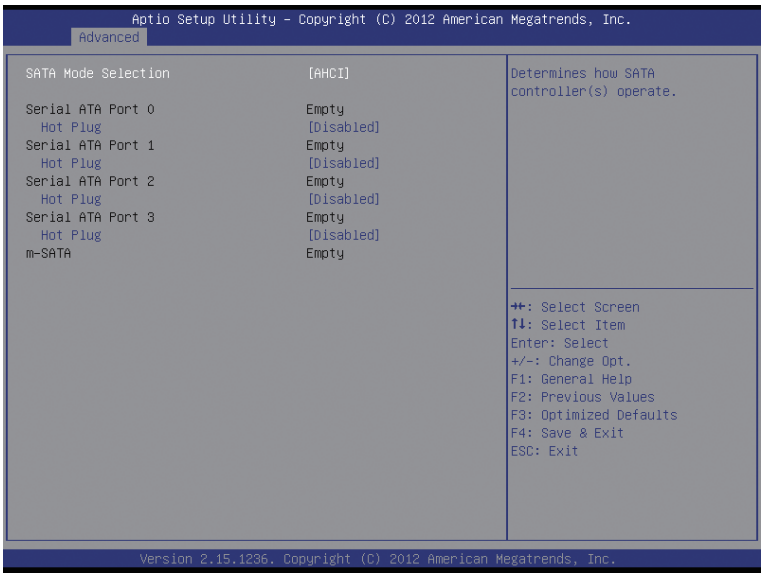
Default setting for C6 is **Enabled**.

☞ **CPU C7 report** (Note)

Allows you to determine whether to let the CPU enter C7 mode in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. The C7 state is a more enhanced power-saving state than C3. Default setting is **CPU C7s**.

(Note) This item is present only when you install a CPU that supports this feature. For more information about Intel CPUs' unique features, please visit Intel's website.

2-2-2 SATA Configuration



☞ **SATA Mode Selection**

Enables or disables RAID for the SATA controllers integrated in the Intel Chipset or configures the SATA controllers to AHCI mode.

- ▸▸ IDE Configures the SATA controller to IDE mode.
- ▸▸ AHCI Configures the SATA controllers to AHCI mode. Advanced Host Controller Interface (AHCI) is an interface specification that allows the storage driver to enable advanced Serial ATA features such as Native Command Queuing and hot plug. (Default)
- ▸▸ RAID Enables RAID for the SATA controller.

☞ **Serial ATA Port 0/Serial ATA Port 1/Serial ATA Port 2/Serial ATA Port 3②③④/mSATA(Note)**

The category identifies Serial ATA and mSATA types of hard disk that are installed in the computer. System will automatically detect HDD type.

Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category.

Hard drive information should be labeled on the outside device casing. Enter the appropriate option based on this information.

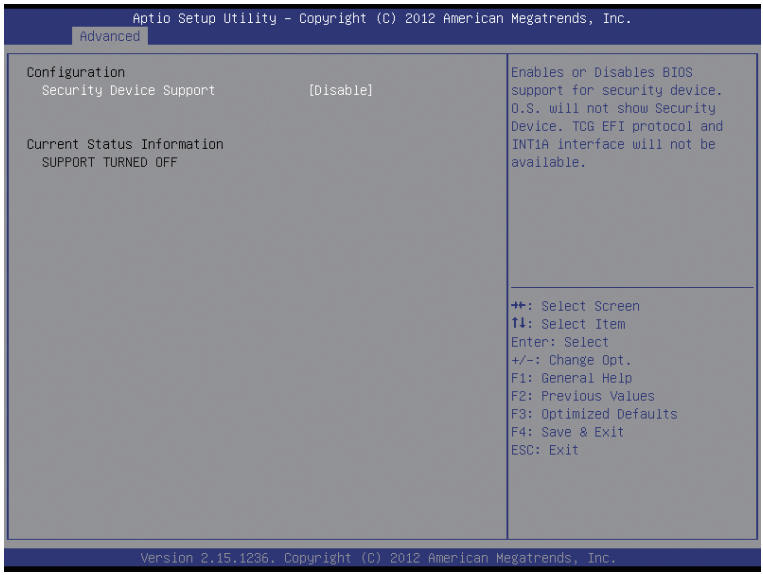
☞ **Hot Plug**

Enables or disable the hot plug capability for each SATA port. (Default: Disabled)

① Only for GA-H81TN.
② Only for GA-B85TN.
③ Only for GA-H87TN.
④ Only for GA-Q87TN.

(Note) Advanced items prompt when this item is enabled.

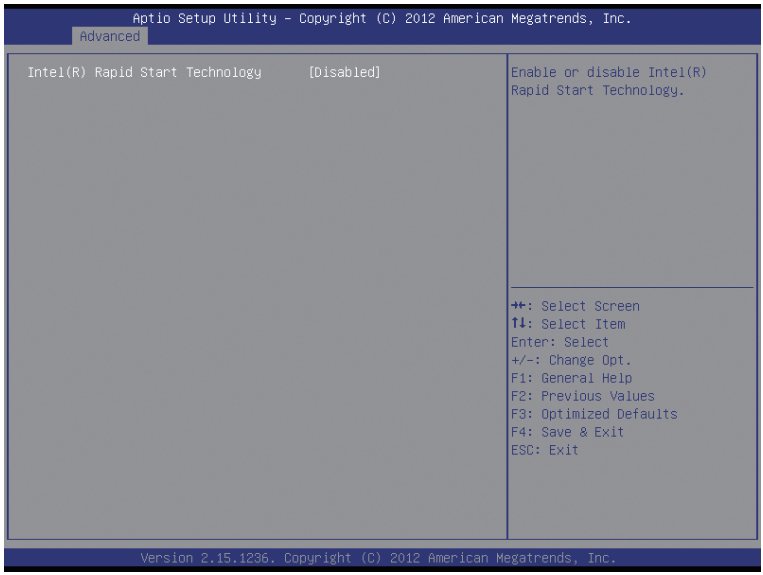
2-2-3 Trusted Computing


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Configuration
Security Device Support [Disable]
Current Status Information
SUPPORT TURNED OFF
Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

☞ **Security Device Support**

Option available: Enabled/Disabled. Default setting is **Disabled**.

2-2-4 Intel (R) Rapid Start Technology


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Intel(R) Rapid Start Technology [Disabled]
Enable or disable Intel(R) Rapid Start Technology.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

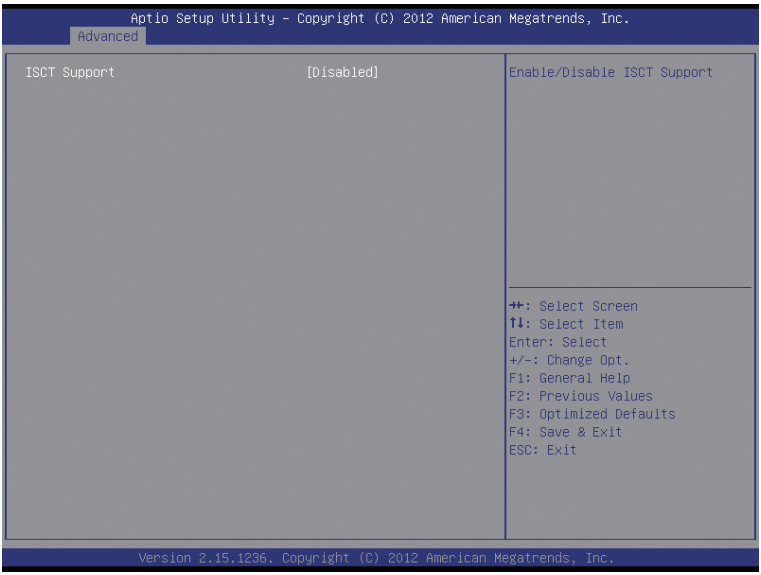
☞ **Intel(R) Rapid Start Technology**(Note)

Enable/Disable the Intel Rapid Start Technology (IRSTe) funciton. The IRSTe enables your system to get up and running faster from even the deepest sleep, saving time and power consumption.

Option available: Enabled/Disabled. Default setting is **Disabled**.

(Note) Advanced items prompt when this item is enabled.

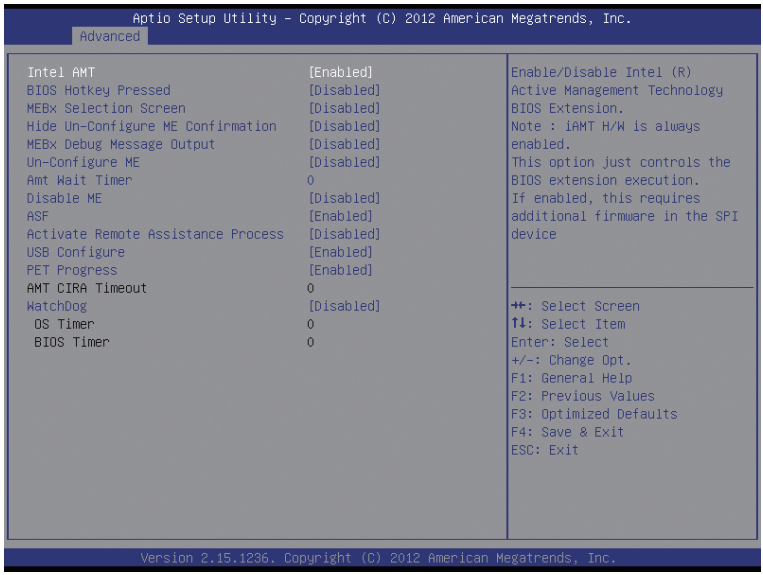
2-2-5 Intel(R) Smart Connect Technology



☞ **ISCT Configuration**

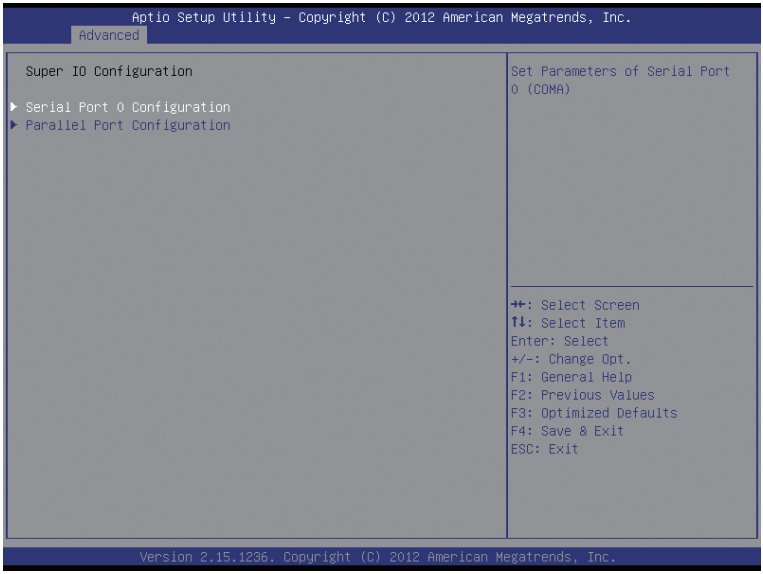
Enables or disables Intel Smart Connect Technology. (Default: Disabled)

2-2-6 AMT Configuration


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Intel AMT [Enabled]
BIOS Hotkey Pressed [Disabled]
MEBx Selection Screen [Disabled]
Hide Un-Configure ME Confirmation [Disabled]
MEBx Debug Message Output [Disabled]
Un-Configure ME [Disabled]
Amt Wait Timer 0
Disable ME [Disabled]
ASF [Enabled]
Activate Remote Assistance Process [Disabled]
USB Configure [Enabled]
PET Progress [Enabled]
AMT CIRA Timeout 0
WatchDog [Disabled]
OS Timer 0
BIOS Timer 0
Enable/Disable Intel (R) Active Management Technology BIOS Extension.
Note : iAMT H/W is always enabled.
This option just controls the BIOS extension execution.
If enabled, this requires additional firmware in the SPI device
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

This section allows you to enable/disable Intel Active Management Technology (Intel AMT) for remote computer management on hardware level and provides you with further configuration options.

2-2-7 Super IO Configuration



☞ **Super IO Configuration**

This section provides information on the super I/O chip and allows you to configure the serial port and parallel port.

☞ **Serial Port 0 Configuration**

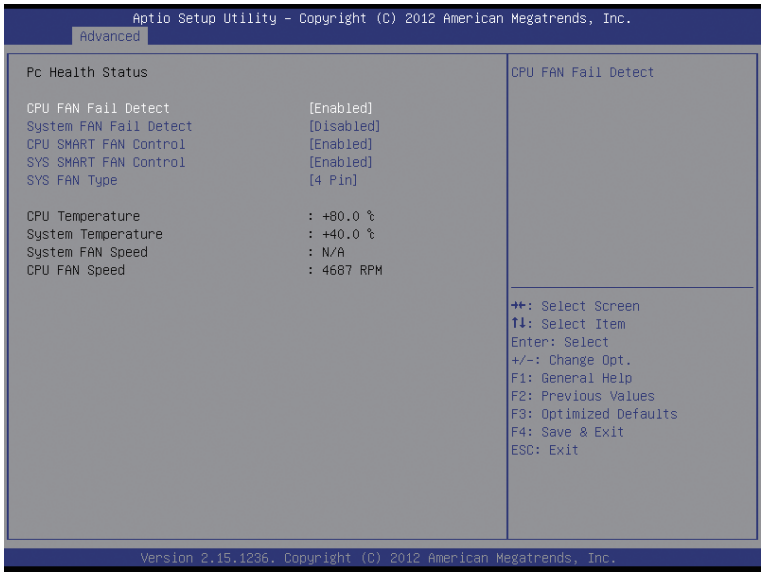
Enables or disables the onboard serial port. (Default: Enabled)

☞ **Parallel Port Configuration**

Enables or disables the onboard parallel port. (Default: Enabled)

2-2-8 H/W Monitor

Press Enter to view the Hardware Monitor screen which displays a real-time record of the CPU/system temperature, and fan speed, Items on this window are non-configurable.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Pc Health Status
CPU FAN Fail Detect [Enabled]
System FAN Fail Detect [Disabled]
CPU SMART FAN Control [Enabled]
SYS SMART FAN Control [Enabled]
SYS FAN Type [4 Pin]
CPU Temperature : +80.0 °C
System Temperature : +40.0 °C
System FAN Speed : N/A
CPU FAN Speed : 4687 RPM
CPU FAN Fail Detect
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

☞ **CPU/System FAN Fail Detect**

Enable CPU/System Fan Stop Warning function.

Option available: Enabled/Disabled. Default setting is **Enabled**.

☞ **CPU/System SMART FAN Control**

Enable CPU/System Smart Fan function.

Option available: Enabled/Disabled. Default setting is **Enabled**.

☞ **SYS FAN Type**

Select system fan type.

Option available: 3 Pin/4 Pin. Default setting is **3 Pin**.

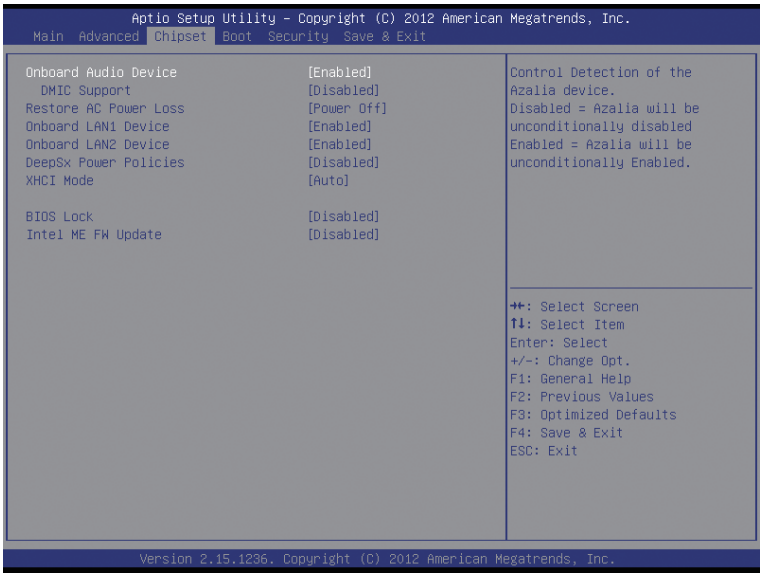
☞ **System/CPU Temperature**

Displays current system and CPU temperature.

☞ **System/CPU Fan Speed (RPM)**

Displays current system and CPU and system fan speed.

2-3 Chipset Menu


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Onboard Audio Device [Enabled]
DMIC Support [Disabled]
Restore AC Power Loss [Power Off]
Onboard LAN1 Device [Enabled]
Onboard LAN2 Device [Enabled]
DeepSx Power Policies [Disabled]
XHCI Mode [Auto]
BIOS Lock [Disabled]
Intel ME FW Update [Disabled]
Control Detection of the Azalia device.
Disabled = Azalia will be unconditionally disabled
Enabled = Azalia will be unconditionally Enabled.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

☞ Onboard Audio Device

Enable/Disable onboard audio controller.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ DMIC Support

Define the Verb Table. Mode A does not support DMIC. Mode B supports DMIC.

Options available: Disabled/Enabled. Default setting is **Disabled**.

☞ Restore AC Power Loss

This option provides user to set the mode of operation if an AC / power loss occurs.

Power On: System power state when AC cord is re-plugged.

Power Off: Do not power on system when AC power is back.

Last State: Set system to the last sate when AC power is removed.

Options available: Power On/Power Off/Last State. Default setting is **Power Off**.

☞ Onboard LAN1/LAN2 Device

Enable/Disable onboard LAN1/LAN2 controller.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ DeepSx Power Policies

Determines whether to let the system consume least power in S5 (shutdown) state. (Default: Disabled)

☞ XHCI Mode

Allows you to determine the operating mode for the xHCI controller in OS.

Smart Auto: This mode is available only when the BIOS supports the xHCI controller in the pre-boot environment. This mode is similar to Auto, but it adds the capability to route the ports to xHCI or EHCI according to setting used in previous boots (for non-G3 boot) in the pre-boot environment. This allows the use of USB 3.0 devices prior to OS boot. xHCI controller enabling and rerouting should follow the steps in Auto, when previous boot routs ports to EHCI. Note: This is the recommended mode when BIOS has xHCI preboot support.

Auto: BIOS routes the sharable ports to EHCI controller. Then it uses ACPI protocols to provide an option to enable the xHCI controller and reroute the sharable ports. Note: This is the recommended mode when BIOS does NOT have xHCI pre-boot support. (Default)

☞ BIOS Lock

Enabled and disable BIOS lock.

Note: For AMT Feature, must enable it. (Default: Disabled)

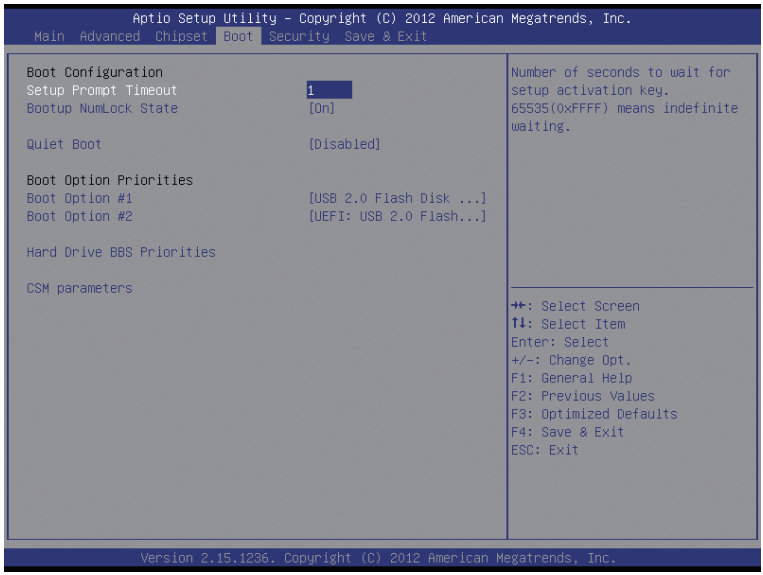
☞ Intel ME FW Update

Enable and disable update capability of ME FW. (Default: Disabled)

Note: After setting changed, must power off system once to active ME FW update capabgbility.

2-4 Boot Menu

The Boot menu allows you to set the drive priority during system boot-up. BIOS setup will display an error message if the drive(s) specified is not bootable.



Setup Prompt Timeout

Number of seconds to wait for setup activation key.

Bootup NumLock State

Allows you to select power-on state for NumLock function.

Options available: On/Off. Default setting is **On**.

Quiet Boot

If enabled, the system will speed the boot up time.

Options available: Enabled/Disabled. Default setting is **Disabled**.

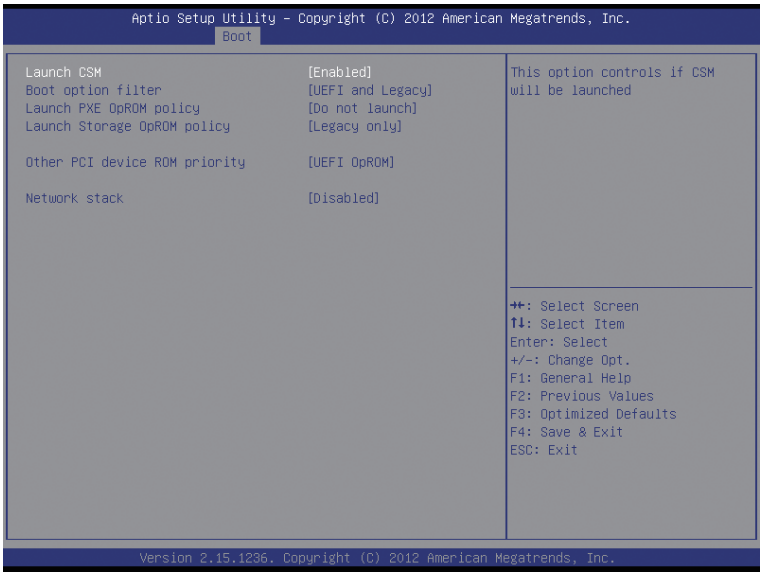
Boot Option Priorities

Specifies the overall boot order from the available devices. For example, you can set hard drive as the first priority (Boot Option #1) and DVD ROM drive as the second priority (Boot Option #2). The list only displays the device with the highest priority for a specific type. For example, only hard drive defined as the first priority on the **Hard Drive BBS Priorities** submenu will be presented here.

Removable storage devices that support GPT format will be prefixed with "UEFI:" string on the boot device list. To boot from an operating system that supports GPT partitioning, select the device prefixed with "UEFI:" string.

Or if you want to install an operating system that supports GPT partitioning such as Windows 7 64-bit, select the optical drive that contains the Windows 7 64-bit installation disk and is prefixed with "UEFI:" string.

CSM parameters


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Boot
Launch CSM [Enabled]
Boot option filter [UEFI and Legacy]
Launch PXE OpROM policy [Do not launch]
Launch Storage OpROM policy [Legacy only]
Other PCI device ROM priority [UEFI OpROM]
Network stack [Disabled]
This option controls if CSM will be launched
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

Launch CSM

Enables or disables UEFI CSM (Compatibility Support Module) to support a legacy PC boot process.

- Enabled — Enables UEFI CSM. (Default)
- Disabled — Disables UEFI CSM and supports UEFI BIOS boot process only.

Boot option filter

Allows you to select which type of operating system to boot.

- UEFI and Legacy — Allows booting from operating systems that support legacy option ROM or UEFI option ROM. (Default)
- Legacy only — Allows booting from operating systems that only support legacy Option ROM.
- UEFI only — Allows booting from operating systems that only support UEFI Option ROM.

This item is configurable only when **Launch CSM** is set to **Enabled**.

Launch PXE OpROM policy

Allows you to select whether to enable the UEFI or legacy option ROM for the LAN controller.

- Do not launch — Disables option ROM. (Default)
- Legacy only — Enables legacy Option ROM only.

This item is configurable only when **Launch CSM** is set to **Enabled**.

Launch Storage OpROM policy

Allows you to select whether to enable the UEFI or legacy option ROM for the storage device controller.

- Do not launch — Disables option ROM.
- Legacy Only — Enables legacy option ROM only. (Default)
- UEFI Only — Enables UEFI option ROM only.

This item is configurable only when **Launch CSM** is set to **Enabled**.

☞ **Other PCI device ROM priority**

Allows you to select whether to enable the UEFI or Legacy option ROM for the PCI device controller other than the LAN, storage device, and graphics controllers.

⏩ UEFI OpROM Enables UEFI option ROM only. (Default)

⏩ Legacy OpROM Enables legacy option ROM only.

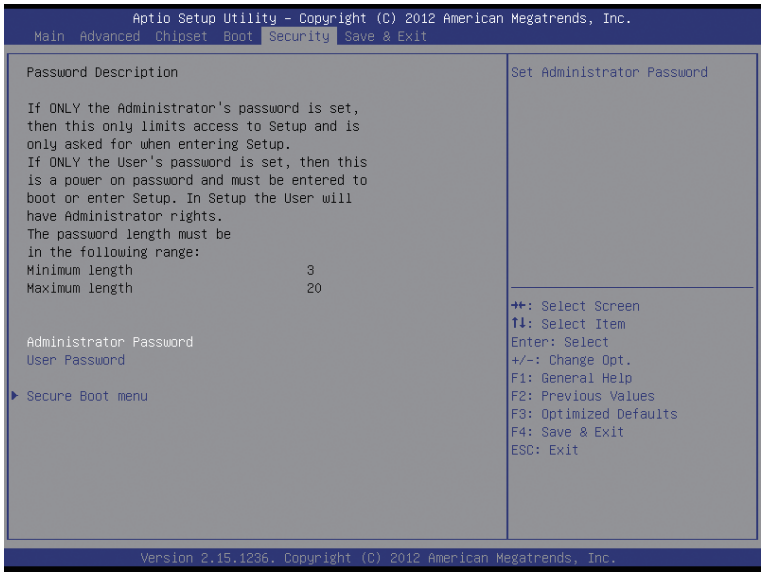
This item is configurable only when **Launch CSM** is set to **Enabled**.

☞ **Network stack**

Disables or enables booting from the network to install a GPT format OS, such as installing the OS from the Windows Deployment Services server. (Default: Disabled)

2-5 Security Menu

The Security menu allows you to safeguard and protect the system from unauthorized use by setting up access passwords.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Password Description
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights.
The password length must be in the following range:
Minimum length 3
Maximum length 20
Administrator Password
User Password
Secure Boot menu
Set Administrator Password
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

There are two types of passwords that you can set:

- Adminstrator Password
  Entering this password will allow the user to access and change all settings in the Setup Utility.
- User Password
  Entering this password will restrict a user's access to the Setup menus. To enable or disable this field, a Administrator Password must first be set. A user can only access and modify the System Time, System Date, and Set User Password fields.

☞ Administrator Password

Press <Enter> to configure the Administrator password.

☞ User Password

Press Enter to configure the user password.

☞ Secure Boot Control

Secure Boot requires all the applications that are running during the booting process to be pre-signed with valid digital certificates. This way, the system knows all the files being loaded before Windows 8 loads and gets to the login screen have not been tampered with.

Options available: Enabled/Disabled. Default setting is **Enabled**.

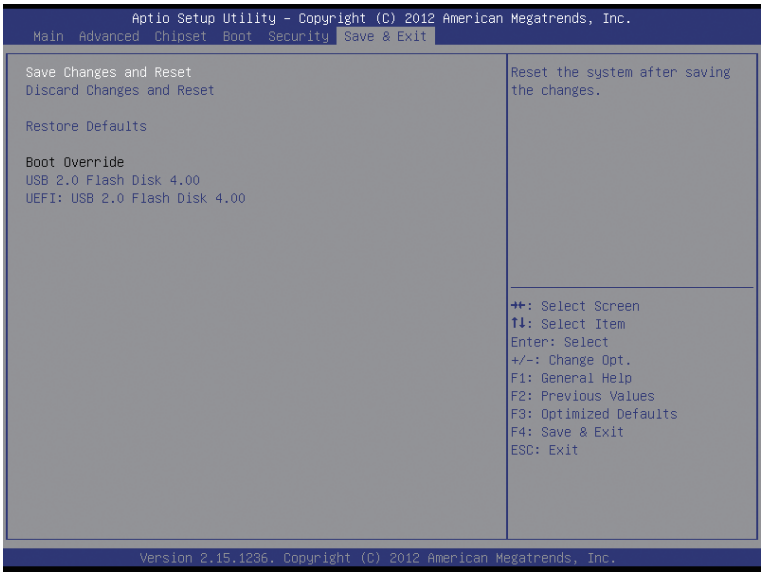
☞ Secure Boot Mode

Define the Secure Boot Mode.

Option available: Standard/Custom. Default setting is **Standard**.

2-6 Save & Exit Menu

The Exit menu displays the various options to quit from the BIOS setup. Highlight any of the exit options then press **Enter**.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Save Changes and Reset
Discard Changes and Reset
Restore Defaults
Boot Override
USB 2.0 Flash Disk 4.00
UEFI: USB 2.0 Flash Disk 4.00
Reset the system after saving the changes.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.

☞ **Save Changes and Reset**

Active this option to reset system after saving the changes.

Options available: Yes/No.

☞ **Discard Changes and Reset**

Active this option to reset system after without saving any changes.

Options available: Yes/No.

☞ **Restore Defaults**

Press <Enter> on this item and then press the <Y> key to load the default BIOS settings.

Options available: Yes/No.

☞ **Boot Override**

Press Enter to configure the device as the boot-up drive.

☞ **UEFI: Built-in in EFI Shell**

Press <Enter> on this item to Launch EFI Shell from filesystem device.